

## Conversion of Examples—Revised

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70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	
B	C	E	F	G	H	I	J	K	L	M	N	O	P	Q	R										
MW	5	6	7	8	9	10	11	12	15	16	17	18	19	20											
nd	1.56637	1.56879	1.58242	1.54874	1.57211	1.57484	1.57474	1.55275	1.57944	1.57467	1.54122	1.58690	1.54708	1.57274											
vd	73.3	71.5	70.0	71.6	70.1	70.2	70.7	71.6	69.1	69.0	74.9	69.3	74.1	71.5											
P <sub>2</sub> O <sub>5</sub>	141.945	24.20	16.14	18.52	20.17	20.17	20.17	18.82	16.14	24.20	21.50	24.20	20.70	19.36											
Al <sub>2</sub> O <sub>3</sub>	101.961	5.80	3.86	3.28	4.83	4.83	4.83	3.40	3.86	5.80	3.28	5.80	3.59	4.64											
BaO	153.326			5.19																					
SrO	103.619							3.38																	
CaO	56.077												2.26												
MgO	40.304										2.21														
BaF <sub>2</sub>	175.324	45.00	40.00	35.00	22.00	35.00	37.00	25.60	60.00	60.00	22.00	35.00	25.75	41.00											
SrF <sub>2</sub>	125.617	20.00	20.00	20.00	13.00	25.00	23.00	14.40	5.00	5.00	13.00	20.00	14.37	20.00											
CaF <sub>2</sub>	78.075			15.00				12.00			15.00		11.98												
MgF <sub>2</sub>	62.302			8.00				6.40			8.00		6.39												
AlF <sub>3</sub>	83.977			5.00																					
GdF <sub>3</sub>	214.245		5.00					1.00																	
Cd <sub>2</sub> O <sub>3</sub>	362.498	5.00	15.00	20.00	16.00	5.00	10.00	15.00	15.00	5.00	15.00	15.00	14.97	8.00											
La <sub>2</sub> O <sub>3</sub>	325.809						5.00							2.00											
Y <sub>2</sub> O <sub>3</sub>	225.810							10.00						2.00											
Yb <sub>2</sub> O <sub>3</sub>	394.078													3.00											
total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0											
F	18.998	15.80	16.05	17.03	20.88	15.15	14.98	15.32	19.91	14.52	20.88	13.63	19.65	14.94											
MgF <sub>2</sub> +CaF <sub>2</sub> +SrF <sub>2</sub> +BaF <sub>2</sub>	65.00	60.00	55.00	58.00	60.00	60.00	60.00	58.40	65.00	65.00	58.00	55.00	58.48	61.00											
Y <sub>2</sub> O <sub>3</sub> +La <sub>2</sub> O <sub>3</sub> +Gd <sub>2</sub> O <sub>3</sub> +Yb <sub>2</sub> O <sub>3</sub>	5.00	15.00	20.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	5.00	15.00	14.97	15.00											

Komiya  
Conversion of Examples - Revised

Conversion of Examples—Revised																			
	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R		
	wt%		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	MW		1.56637	1.56970	1.58242	1.54874	1.57211	1.57484	1.57275	1.57944	1.57467	1.54122	1.58590	1.54708	1.57274				
	nd		73.3	71.5	70.0	71.6	70.1	70.2	70.7	71.6	69.1	69.0	74.9	69.3	74.1	71.5			
	vd		30.0	20.0	20.0	17.0	25.0	25.0	25.0	17.6	20.0	30.0	17.0	30.0	18.6	24.0			
8	Al(PO <sub>3</sub> ) <sub>2</sub>	263.897				10.0													
9	Ba(PO <sub>3</sub> ) <sub>2</sub>	295.271								8.0									
10	Sr(PO <sub>3</sub> ) <sub>2</sub>	245.564														8.0			
11	Ca(PO <sub>3</sub> ) <sub>2</sub>	198.022												10.0					
12	Mg(PO <sub>3</sub> ) <sub>2</sub>	182.249																	
13	BaF <sub>2</sub>	176.324		45.0	40.0	35.0	22.0	35.0	37.0	33.0	25.6	60.0	60.0	22.0	35.0	25.8	41.0		
14	SrF <sub>2</sub>	126.617		20.0	20.0	20.0	13.0	26.0	23.0	27.0	14.4	5.0	5.0	18.0	20.0	14.4	20.0		
15	CaF <sub>2</sub>	78.078					15.0				12.0			15.0		12.0			
16	MgF <sub>2</sub>	62.302				5.0	8.0				6.4			8.0		6.4			
17	AlF <sub>3</sub>	83.977			5.0						1.0								
18	GdF <sub>3</sub>	214.245																	
19	Gd <sub>2</sub> O <sub>3</sub>	362.498		5.0	15.0	20.0	16.0	5.0	10.0	5.0	15.0	16.0	6.0	16.0	16.0	16.0	8.0		
20	La <sub>2</sub> O <sub>3</sub>	325.809							5.0								2.0		
21	Y <sub>2</sub> O <sub>3</sub>	225.810															2.0		
22	Yb <sub>2</sub> O <sub>3</sub>	394.078								10.0								3.0	
23	Total			100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
24	AgF <sub>2</sub> +CaF <sub>2</sub> +SrF <sub>2</sub> +BaF <sub>2</sub>			65.0	60.0	55.0	58.0	60.0	60.0	60.0	58.4	65.0	65.0	58.0	55.0	58.5	61.0		
25	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R		

26	mol	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
27	MW																
28	nd																
29	vd																
30	AlPO <sub>3</sub>	263.897	=E8/\$C30														
31	Ba <sub>2</sub> (PO <sub>3</sub> ) <sub>2</sub>	295.271															
32	Sr <sub>2</sub> (PO <sub>3</sub> ) <sub>2</sub>	245.564															
33	Ca <sub>2</sub> (PO <sub>3</sub> ) <sub>2</sub>	198.022															
34	Mg <sub>2</sub> (PO <sub>3</sub> ) <sub>2</sub>	182.240															
35	BaF <sub>2</sub>	175.324	=E13/\$C35														
36	SrF <sub>2</sub>	126.617	=E14/\$C36														
37	CaF <sub>2</sub>	78.075															
38	MgF <sub>2</sub>	62.302															
39	AlF <sub>3</sub>	83.977															
40	GdF <sub>3</sub>	214.245															
41	Gd <sub>2</sub> O <sub>3</sub>	302.498	=E19/\$C41														
42	La <sub>2</sub> O <sub>3</sub>	325.809															
43	Y <sub>2</sub> O <sub>3</sub>	225.810															
44	Yb <sub>2</sub> O <sub>3</sub>	394.078															
45	total		=SUM(E30:E44)														
46	F	18.9884	=E35+E36+E37+E38)*2+(E39+E40)*3														
47	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R

25	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
26	mol		5	5	6	7	8	9	10	11	12	15	16	17	18	19	20
27		MW		1.6637	1.56879	1.56242	1.54874	1.57211	1.57484	1.57474	1.55275	1.57944	1.57467	1.54122	1.58550	1.54708	1.57274
28	nd			73.3	71.5	70.0	71.6	70.1	70.2	70.7	71.3	69.1	69.0	74.9	69.3	74.1	71.5
29	vd			0.1137	0.0756	0.0758	0.0644	0.0947	0.0947	0.0947	0.0667	0.0758	0.1137	0.0644	0.1137	0.0705	0.0909
30	Al(PO <sub>3</sub> ) <sub>3</sub>	263.891	=E8/\$C30				0.0339										
31	Ba(PO <sub>3</sub> ) <sub>2</sub>	295.271									0.0326					0.0404	
32	Sr(PO <sub>3</sub> ) <sub>2</sub>	245.564												0.0549			
33	Ca(PO <sub>3</sub> ) <sub>2</sub>	198.022												0.1255	0.1996	0.1472	0.2339
34	Mg(PO <sub>3</sub> ) <sub>2</sub>	182.249									0.1460	0.3422	0.3422	0.1255	0.1996	0.1472	0.2339
35	BaF <sub>2</sub>	175.324	=E13/\$C35	0.2667	0.2281	0.1996	0.1255	0.1996	0.2110	0.1882	0.1460	0.3422	0.3422	0.1255	0.1996	0.1472	0.2339
36	SrF <sub>2</sub>	126.617	=E14/\$C36	0.1592	0.1692	0.1692	0.1035	0.1990	0.1831	0.2149	0.1146	0.0398	0.0398	0.1035	0.1592	0.1146	0.1592
37	CaF <sub>2</sub>	78.075					0.1921				0.1537			0.1921		0.1537	
38	MgF <sub>2</sub>	62.302					0.1284				0.1027			0.1284		0.1027	
39	AlF <sub>3</sub>	83.977				0.0595					0.0047						
40	GdF <sub>3</sub>	214.245			0.0233												
41	Gd <sub>2</sub> O <sub>3</sub>	362.498	=E19/\$C41	0.0138	0.0414	0.0552	0.0414	0.0138	0.0276	0.0138	0.0414	0.0414	0.0138	0.0414	0.0414	0.0414	0.0221
42	La <sub>2</sub> O <sub>3</sub>	325.802							0.0153								0.0061
43	Y <sub>2</sub> O <sub>3</sub>	225.810								0.0443							0.0089
44	Yb <sub>2</sub> O <sub>3</sub>	394.078						0.0254									0.0076
45	total		=SUM(E30:E44)	0.5	0.5	0.5	0.7	0.5	0.5	0.6	0.7	0.5	0.5	0.7	0.5	0.7	0.5
46	F	18.9984	=(E35+E36+E37+E38)*2+(E39+E40)*3	0.8318	0.8447	0.8963	1.099	0.7973	0.7883	0.8063	1.0482	0.7641	0.7641	1.099	0.7177	1.0364	0.7861
47	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
48	proportional divisions by weight																
49	MW		5	5	6	7	8	9	10	11	12	15	16	17	18	19	20
50	nd			1.56637	1.56879	1.56242	1.54874	1.57211	1.57484	1.57474	1.55275	1.57944	1.57467	1.54122	1.58550	1.54708	1.57274
51	vd			73.3	71.5	70.0	71.6	70.1	70.2	70.7	71.3	69.1	69.0	74.9	69.3	74.1	71.5
52	P <sub>2</sub> O <sub>5</sub>	141.946	=(E30*3/2)+E31+E32+E33+E34)*\$C52	24.20	16.14	16.14	18.52	20.17	20.17	20.17	18.82	16.14	24.20	21.50	24.20	20.74	19.36
53	Al <sub>2</sub> O <sub>3</sub>	101.961	=E30/2)*\$C53	5.80	3.86	3.86	3.28	4.83	4.83	4.83	3.40	3.86	5.80	3.28	5.80	3.59	4.64
54	BaO	153.328					5.19										
55	SrO	103.619									3.38						
56	CaO	66.077														2.27	
57	MgO	40.304												2.21			
58	BaF <sub>2</sub>	175.324	=E35*\$C58	45.00	40.00	36.00	22.00	36.00	37.00	33.00	25.00	60.00	60.00	22.00	35.00	25.80	41.00
59	SrF <sub>2</sub>	125.617	=E36*\$C59	20.00	20.00	20.00	13.00	25.00	23.00	27.00	14.40	5.00	5.00	13.00	20.00	14.40	20.00
60	CaF <sub>2</sub>	78.076					16.00				12.00			15.00		12.00	
61	MgF <sub>2</sub>	62.302					8.00				6.40			8.00		6.40	
62	AlF <sub>3</sub>	83.977			5.00						1.00						
63	GdF <sub>3</sub>	214.245			5.00												
64	Gd <sub>2</sub> O <sub>3</sub>	362.498	=E41*\$C64	5.00	16.00	20.00	15.00	5.00	10.00	5.00	15.00	15.00	5.00	15.00	15.00	15.00	8.00
65	La <sub>2</sub> O <sub>3</sub>	325.809							5.00								2.00
66	Y <sub>2</sub> O <sub>3</sub>	225.810								10.00							2.00
67	Yb <sub>2</sub> O <sub>3</sub>	394.078						10.00									3.00
68	total		=SUM(E52:E67)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.2	100.0
69	F	18.9984	=E46*\$C69	15.802	15.049	17.028	20.879	15.147	14.976	15.319	19.913	14.516	14.516	20.879	13.635	19.691	14.935
70	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
47																	
48			proportional divisions by weight														
49		MW	5	1.66637	1.66679	1.69242	1.64874	1.67211	1.67484	1.67474	1.67474	1.67474	1.67467	1.67467	1.67467	1.67467	1.67274
50	nd			73.3	71.6	70.0	71.5	70.1	70.2	70.7	71.6	69.1	69.0	74.9	69.3	74.1	71.5
51	vd																
52	P <sub>2</sub> O <sub>5</sub>	141.946	$= (E30 \cdot 3/2) + E31 + E32 + E33 + E34 \cdot SC52$	24.20	16.14	16.14	18.62	20.17	20.17	20.17	18.82	16.14	24.20	21.60	24.20	20.74	19.36
53	Al <sub>2</sub> O <sub>3</sub>	101.961	$= (E30/2) \cdot SC53$	5.60	3.86	3.86	3.28	4.83	4.83	4.83	3.40	3.86	5.80	3.28	5.80	3.59	4.64
54	B <sub>2</sub> O <sub>3</sub>	103.326					6.19				3.38						
55	SrO	103.618															
56	CaO	66.077															
57	MgO	40.804											2.21				
58	BaF <sub>2</sub>	176.324	$= E35 \cdot SC58$	45.00	40.00	35.00	22.00	35.00	37.00	33.00	26.00	60.00	60.00	22.00	36.00	25.80	41.00
59	SrF <sub>2</sub>	126.617	$= E36 \cdot SC59$	20.00	20.00	20.00	15.00	25.00	23.00	27.00	14.40	5.00	5.00	13.00	20.00	14.40	20.00
60	CaF <sub>2</sub>	78.076					8.00				6.40			8.00		6.40	
61	MgF <sub>2</sub>	62.302				5.00											
62	AlF <sub>3</sub>	83.977															
63	CaF <sub>2</sub>	214.246		5.00							1.00						
64	Ca <sub>2</sub> O <sub>2</sub>	362.498	$= E41 \cdot SC64$	5.00	15.00	20.00	16.00	6.00	10.00	5.00	16.00	16.00	6.00	15.00	15.00	8.00	2.00
65	La <sub>2</sub> O <sub>3</sub>	325.800															2.00
66	Y <sub>2</sub> O <sub>3</sub>	226.810									10.00						2.00
67	Y <sub>2</sub> O <sub>3</sub>	394.078						10.00									3.00
68	total		$= \text{SUM}(E62:E67)$	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.2	100.0
69	F	18.9984	$= E40 \cdot SC69$	15.802	16.049	17.028	20.870	16.147	14.976	16.319	19.913	14.516	14.516	20.879	13.636	19.651	14.935
70			D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
71	wt%			6	6	7	8	9	10	11	12	15	16	17	18	19	20
72		MW	5	1.66637	1.66679	1.69242	1.64874	1.67211	1.67484	1.67474	1.67474	1.67474	1.67467	1.67467	1.67467	1.67467	1.67274
73	nd			73.3	71.6	70.0	71.5	70.1	70.2	70.7	71.6	69.1	69.0	74.9	69.3	74.1	71.5
74	vd																
75	P <sub>2</sub> O <sub>5</sub>	141.946	$= E52/E568 \cdot 100$	21.20	16.14	16.14	18.62	20.17	20.17	20.17	18.82	16.14	24.20	21.60	24.20	20.70	19.36
76	Al <sub>2</sub> O <sub>3</sub>	101.961	$= E53/E568 \cdot 100$	6.80	3.86	3.86	3.28	4.83	4.83	4.83	3.40	3.86	5.80	3.28	5.80	3.59	4.64
77	B <sub>2</sub> O <sub>3</sub>	103.326					6.19				3.88						
78	SrO	103.618															
79	CaO	66.077														2.26	
80	MgO	40.804												2.21			
81	BaF <sub>2</sub>	176.324	$= E58/E568 \cdot 100$	45.00	40.00	35.00	22.00	35.00	37.00	33.00	26.00	60.00	60.00	22.00	36.00	25.76	41.00
82	SrF <sub>2</sub>	126.617	$= E59/E568 \cdot 100$	20.00	20.00	20.00	15.00	25.00	23.00	27.00	14.40	5.00	5.00	13.00	20.00	14.87	20.00
83	CaF <sub>2</sub>	78.076					8.00				12.00			16.00		11.98	
84	MgF <sub>2</sub>	62.302									6.40			8.00		6.39	
85	AlF <sub>3</sub>	83.977				5.00											
86	CaF <sub>2</sub>	214.246		5.00							1.00						
87	Ca <sub>2</sub> O <sub>2</sub>	362.498	$= E64/E568 \cdot 100$	5.00	16.00	20.00	16.00	6.00	10.00	5.00	16.00	16.00	6.00	15.00	16.00	14.97	8.00
88	La <sub>2</sub> O <sub>3</sub>	326.800							5.00								2.00
89	Y <sub>2</sub> O <sub>3</sub>	226.810								10.00							2.00
90	Y <sub>2</sub> O <sub>3</sub>	394.078						10.00									3.00
91	total		$= \text{SUM}(E76:E90)$	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
92	F	18.998	$= E69/E568 \cdot 100$	15.80	16.05	17.03	20.88	15.15	14.98	15.32	19.91	14.62	14.62	20.88	13.63	19.65	14.94
93	AlF <sub>3</sub> ·CaF <sub>2</sub> +SrF <sub>2</sub> ·CaF <sub>2</sub>			65.00	60.00	55.00	68.00	60.00	60.00	60.00	60.00	68.40	65.00	58.00	65.00	58.48	61.00
94	Y <sub>2</sub> O <sub>3</sub> ·La <sub>2</sub> O <sub>3</sub> +Ca <sub>2</sub> O <sub>2</sub> ·Y <sub>2</sub> O <sub>3</sub>			5.00	16.00	20.00	16.00	15.00	15.00	15.00	15.00	16.00	16.00	6.00	15.00	14.97	15.00